

Ira Sawyer,

Field Note Book, 1888.

- loc no.      Locality
- 1200      Monday, Co. NY
- 1201      Lafayette -
- 1202      Otisco
- 1203      Preble
- 1204      Vesper
- 1205      Fabius
- 1206      Picketts
- 1207      Tinkers Falls,
- 1208      Wuxton,
- 1209      Cuyler
- 1210      De Ruyter
- 1211      Nelson
- 1212      Georgetown -



Tully, Onondaga Co., N. Y.,  
Saturday, August 18, 1888.

I have, today, verified the presence of Tully Limestone about a mile up the small stream that runs the gristmill at Tully; but I do not yet find it in situ. In several places, I find large blocks of it, which have been undermined by the water, and let down some feet.

West of the village, about half a mile, on the land of George W. Gardiner, I find, in situ, at the head of a small spring branch, 50 rods north of Mr. Payne's barn.

Here the exposure is in three sections. From the bottom of the first to the bottom of the second is 5 ft. 5 in. From



2

bottom of the second to the  
bottom of the third is 6 feet  
and five inches; and from  
the bottom of the third to  
its top is  $8\frac{1}{2}$  feet and 2 inches.  
making in the aggregate

$20\frac{1}{4}$  feet,  $0$   
Dip  $\approx 1\frac{1}{2}$  - exact average.  
The first section,  $5' + 5'$ , is a dark  
colored shale at the bottom,  
slightly calciferous, but becoming  
gradually more and more  
calciferous, until, at the top  
it has all the characteristics of  
the Gully Limestone.

The second section,  $6' + 5'$ , though  
in quite a compact stratum  
has, in weathering, an appear-  
ance of being thin-bedded. It  
seems scarcely fissile along planes  
of stratification.

Some blocks along the mill  
branch, indicate planes of



Stratification.

The third section, 8° E, is broken and shaly. It is somewhat more calciferous than Section No. 1.

The main Limestone, on a fresh surface, is a drab-grey. On a weathered surface, it is very light blue and smooth.

The upper stratum has some portions that weather into a dark argillaceous soily mass, with sometimes a solid calciferous centre. Further N, this last part of the breakage of all the calciferous portion is chunky. Local.

Through all parts are seams highly fossiliferous.

Chonetes are abundant through all parts. Atrypas, Spirifers, some Lamellibranchs, crinoids, Zaphrentes, and Lingulae.



About fifty yards down the branch, is an exposure of the upper Hamilton Shales, full of fossils.

I have nowhere yet seen the Genesee Shales above.

Since writing the above, I find them abundant just west of this exposure.

Δ 1200

About fifty yards down the branch, is an exposure of the Upper Hamilton Shales, full of fossils. Color ash gray.

I have nowhere yet seen the Genesee Shales above the Limestone. They are here.

1200 A loose are manifestly from the upper part of the middle section.

1200 A1 are from section No 1, at or within the lowest 18 inches.

1200 A2 are from the top of section No 2.

1200 A3 are from the middle of section No 3.



Tully, <sup>5</sup>Oranaga Co., N. Y.  
Monday, August 20, 1888.  
A 3 - from 17 to 20 feet above base.

A - 1 About 25° below A<sub>1</sub>,  
and 50 yards down the little  
spring branch.

This is the Upper Hamilton  
Shales.

Section of Tully Limestone  
in the  
Gardiner Glen Exposure  
Hill above.

8' + 2' Broken

6' + 5' solid Limestone

3' + 5' Base.

Hamilton Shales

High Rocks

High Rocks



Section at  
Strail's Glen  
Genesee Shales.

Branch

555

555

1 Trilobite

20' 6"

555

555

4' 2" Limestone

10' Shale

3' 2" Base of Limestone

Shaly, about a foot

5' 8" Hamilton Shales

Hamilton

Shales

Branch

←



Tully, Oneida Co., N. Y.  
 Tuesday, August 21, 1888.

1200 B. About 2 miles  
 north of Tully Station,  
 on the very top of the ridge  
 which begins at or very near  
 the Clayton Hotel, is a  
 sharp comb of the ridge.  
 This comb is the Tully  
 Limestone. Still there is  
 almost no exposure here.  
 A short distance off the  
 northern end of this, is one  
 very large mass of the rock  
 nearly in situ, a little  
 tilted. It belongs to the  
 middle section of the  
 rock, at A., and contains  
 on its upper surface,  
 several Zaphrentes.  
 In other places, I have seen  
 Zaphrentes in this rock.



August 21, 1888.  
This Limestone forms the  
bedrock for over a  
mile on the top of ridge.  
The road <sup>reaches</sup> ~~crosses~~ the  
Limestone on the line  
between the <sup>Wm</sup> Scheels and  
McKilla's farms.

This morning, I have  
seen thousands of Zaphren-  
toids, and two Favosites.  
Broken Orinoid Stems  
frequently constitute  
the main mass of this  
Limestone.

Afternoon.

I continue tracing this stone  
north to the south line of  
Mr Jones' farm, where the  
road descends from the top  
of the limestone fully forty feet  
to the Hamilton Shales, about  
30 rods south of Mr Jones' house.



August 21, 1888.

I find the topmost stratum of this rock to be a calciferous Quartzite, about 24 to 30 inches thick. The under side almost pure Limestone, the uppermost scale is the black Genesee Shale.

It is quite fossiliferous, containing Zaphrentoids, and Atrypae, &c., &c.

The Limestone lixiviates, when under soil, and the Quartzite grains have so little cohesion, the rock is easily broken down.

Its primary color is sky blue. Its first change is to a <sup>orange</sup> yellow, resulting from iron. It ultimately becomes amber brown.



August 21, 1888.

My discoveries today modify, very decidedly, the views held by geologists, relative to this group of rocks.

First, it shows very vividly, by its flexures, the unevenness of the sea bottom, on which it was formed. Variations of fifty feet are within sight of the Chase prairie.

The Tennessee Shale has been cut into many low knobs, the limestone, of course, lying under them, nearly to the top of some.

Second, the fossils are particularly Graptolites, Favosites, Crinoids, and the like, are most prominent.



Tully, <sup>10</sup> Onondaga Co., N.Y.  
Thursday, Aug. 23, 1888  
1200 B.

On the ridge south of  
Cardiff, on John Coughlin's <sup>land</sup>  
farm, Shales on the  
highest knolls, and  
Tully Limestone on a sloping  
Variation in altitudes  
not less than 100 feet.

In the lot east of Mr. Jones'  
house are Tully Limestones.  
in situ

In the lot east of Samuel  
Coughlin's house, is a large  
rock, Tully Limestone on  
one side, and Calcareous  
sandstone on the other.  
I have seen several others,  
but this is the largest.



In the p.m., I gathered  
specimens from the falls  
in a spring branch east  
of Lully Kenton.

The thickness here is  
about 28 1/2 feet.

Dip  $8-1\frac{1}{2}^{\circ}$  S.  $1^{\circ}$  S 70 W.

1200 C<sub>1</sub> is the very base  
of Lully Limestone, as  
exposed here.

1200 C<sub>2</sub> is the very top  
of Hamilton Shales.

C<sub>1</sub> & C<sub>2</sub> are in juxtapo-  
sition or within a few  
inches has C<sub>2</sub> below C<sub>1</sub>.



1  
Sunday, Enonstage Co. N. Y.  
Friday, August 24, 1888.  
Rather good fossils at the  
Spring mouth fall, east of  
Gully Centre.

1200 ft., about 5 feet  
above the base of Gully line  
stone.

1200 ft., about 20 to 25 feet  
above the base.

This layer is rich in  
*Trilobites* and *Atrypa* *Oriskany*.  
I found an *Oriskany*.  
Diameter of chamber of *Trilobites*  
about 1 1/2 in. in diameter,  
the intersegmental, about  
3 inches long.

*Trilobites* were in files.

This rock is spreading  
variable in character.

Fish. scaled?



13  
Tully, Tennessee, K. G. -  
Saturday, August 25, 1855.  
I found the head of a large  
Trilobite <sup>about</sup> in the sand, about  
60 feet up the stream, above  
the fall, and about 23' above  
the base of the Limestone.

In the afternoon, I examined  
three outcrops,  $1\frac{1}{2}$  & 2 miles  
north of P. O.

The first, on the west  
side of the Troughwinga,  
at the crossing of the road  
towards La Fayette, near  
the house of Mr. Ball.

This is not a fair exposure.  
Above, or west of the road,  
the middle section stretches  
off under a marshy meadow,  
of about  $\frac{1}{2}$  an acre.

I observed the ordinary  
fossils of the bottom of



Tully Limestone top of ridge

10

20

30

40

29

Gannett Slates

Tully lime in the hill

Road to La Fayette

31

Franklin

Franklin house

Tully Limestone

Gannett on ridge

Side

The middle section, and some of the 3 section, in the broken rocks below the second exposure, 2 miles east northeast of Mr. Bond's house, on the east side of Tioughnioga, is considerably higher than the same rock directly opposite on the west side of the stream - not less than 25° higher, thus showing a decided flexure from east to west.

I could not get the dip at any of these places - inequalities in level, can be accounted for on no other supposition than inequalities of the ocean bed.



15  
Tully, Oneida Co., N. Y., —  
Monday, August 27, 1888 —  
Examined John Oneby's  
Glen, outcrop.

1200 J.

Dip 0°. Over 25 feet  
thick as per Level.  
Rock is exposed in  
Lobby falls, towards north.  
Towards top, shaly, black  
Calcareous Argillite.

In the p.m., I determine the  
outcrop on Meeker Hill, about  
or near the north line of Lot 20, and  
terminates about 100 rods north of  
the town line, on Lot 90 of Lappell.  
I find here clear proof of a terminal  
moraine, filled with northern drift  
together with Tully Limestone  
just scraped from its bed, lying  
directly under the moraine.

1200 E from Meeker Hill outcrop  
Lot 10, Tully.



Lully, Oneida Co., N. Y.,  
Tuesday, August 28, 1882.

I go to Cardiff, and do not  
find Lully there in situ, but  
see a lot of material in the hill east.

1201 A. Lully Valley, Lot 85.

La Fayette, on the farm of Clark

Estey, a coarse Arenaceous  
Limestone, in the midst of  
Upper Hamilton Shales.

1201 B. Lot 89, Gaylord's farm  
southwest corner, about  
one mile east of Clark  
Estey's house.

Lully Limestone does not  
appear in force on this hill,  
which faces south; but  
Lully Limestone appears  
on the surface, and is not  
there.

40 feet below the position of  
the preceding note, among the thick



12013.  
Here, a few feet further  
down the hill, we find the  
Tully Limestone in force,  
a full 100 feet below the top  
of the ridge; on the north  
bank of Gaylord's Gulf.

In one of the upper rocks, we  
find many Trilobites.

12014. About 150 feet lower, is  
a fall in Gaylord's Gulf stream,  
about 50 feet.

This rock resembles, very  
strikingly, the Lower Section  
of Tully Limestone. Calceps  
and Arenaceus Shale.

The entire aspect of the rocks,  
in situ, 25 feet above the  
upper rock in the falls, is  
that of the Lower Section of  
Tully Limestone; but it is  
fully 150 feet lower than the  
Tully found above.



Notes. It remains to be noticed, that the Tully Limestone found on the southwest corner of Lot 89, La Fayette, is about 150 feet lower than the out-crop on Flecker Ridge, near Samuel Rayley's house, about one mile southeast of this.

At several exposures of the Hamilton Shales, as also at the above-named falls, the rocks are all horizontal. The line of the Tully Limestone, from Tully northward is quite strongly undulating, thus somewhat like this.

x120173

Note 2. Onondaga Creek runs in a much lower valley than the Schoharie river, probably 250 or 300 feet lower.

Across its southern end is a moraine of about 300 feet high. The little lake which runs up into Onondaga Creek,



is caused by this moraine  
dam across what was its  
original channel, before  
the Glacial Epoch.

Its present channel through  
the moraine was cut by  
man.

3-Just north of this moraine  
a well is now being sunk.  
At the depth of 20 feet they  
are now in quicksand,  
showing that before the  
Glacial period there was a  
small lake or an arm of  
Crawford Lake.

4-On the west side of the  
valley, at the foot of the  
moraine, is a small  
spring of cool water, which  
has formed a very heavy  
bed of Calcareous Tuff, and  
is still forming it. This  
Tuff is many feet  
thick.



The hole, mentioned on the preceding page, was driven down 365 feet, when the redistance of the sand became too great to be overcome, and the drillers removed their apparatus. The top of the moraine is 900 feet above Syracuse. From the top down to the top of the hole is about three hundred feet: so the bottom of the hole is still 235 feet above Syracuse.

Tully, Oneida Co., N. Y.,  
Wednesday, August 27, 1886.  
I examined the upper Hamilton Shales, on the east side of Christian, or Tully Valley, in the hills.

Tip 0 -  
Near the top of the hill, and close under the Tully Limestone, was an opening 5' wide and very deep, of unknown length. It extended east and west. This very clearly shows the fracturing of a gigantic movement.

At about this same level, there have occurred, at various periods, explosions of gas, threw out the dirt, in one case over two hundred cubic feet of dirt, at a time! say 10 times. There are a number of these holes.



This is on the <sup>21.</sup> east part of  
Lot 8th, on the farm of  
Mr. Sanchez.

Here, some thirty feet up  
the hill, is exhibited the  
same coarse, calciferous sand  
stone <sup>on arenaceous limestone</sup> mentioned yesterday.  
1201 d. Interesting specimens.  
This afternoon I went to the  
Gaylord Gulf to the falls.

The same arenaceous  
limestone forms the floor  
of the Gaylord Gulf for over  
forty feet. It is here about  
15 inches thick.

In the wall of Hamilton  
Shales forming the fall, the shale  
presents usual appearance,  
until near the top. The upper  
layer simulates the  
lower member of Valley  
limestone. In fact the  
150 feet of Hamilton Shales



22

present all the appearance  
of the lower part of Tully  
Limestone.

This gorge is cut back  
about half a mile, and  
has been continuing the  
glacial epoch.

1201 & are from the bottom  
of this gorge, about half  
way from the mouth.



23-

Saturday, Sept. 7, 1888

Mizzly nearly all forenoon

In p.m., I gathered fossils  
from Strailer's Glen, just west  
of Billy's Centre

120064

120062

120063 - Many *Trilobites*  
About 25 feet above the base -  
the rock is silty, in the south  
bank. *Trilobites* mostly  
large.



24. Tully

Monday, Sept. 3, 1888 -  
Gathered Fossils all day.  
1200 B3 - Large Trilobites

Tully

Tuesday, Sept. 4, 1888 -  
Gathered Fossils.  
1200 B3 - a m

1200 A2 }  
1200 A2+ } p.m.  
1200 A3+ }

A3+ is from the bottom of  
the upper Shaly portion.  
These do not appear lower  
in situ as I have seen  
the same near Oshes?  
I recognize them. They are  
in a well just above the exposure.



25 Truly  
Wednesday, Sept. 2, 1885  
1200 F 17 miles N. of  
P.O., lower below the fall  
at the roadside

1200 G fall in lot (29) S. 8.  
Thickness 45 feet

1200 G Loc in stream below.

1200 G is the best exposure  
I have seen for studying  
the lithology of this rock.  
It is completely exposed  
even to the very top.

The uppermost stratum  
is a calcareous Argillite,  
very firm - little lime -



Lilly, Clarendon Co., N. C.  
Thursday, September 7, 1888.

I visit Bear Mountain, just  
east of Maple Grove Church.  
A long exposure on the ridge.

Dip  $1\frac{1}{2}$  S. There is another sudden  
and remarkable depression of this  
limestone. Along the east side of  
the ridge - Bear Mountain top, is the  
eastern edge of the escarpment.  
Proceeding northward, it drops at least  
40 feet, and proceeds about 100 rods  
to the end. On the west side this  
depression is not noticeable.

In striking the level east, this  
exposure is exactly as high as the  
crest of Pompey Hill, and more  
than 100 feet higher than the exposure  
east of Cardiff.

West of Maple Grove Church, on  
the ridge running north from  
Clisco P.O., is another long tongue  
of Lilly Limestone. H. B. Thibault  
the same level as Bear Mountain.



27.

On Lot 86, south of the road  
along side of the stream - a deep  
and impassable gorge - is an  
exposure in the north face of  
the hill south of Bear Mountain  
12026. This escarpment runs  
along round the east face of the  
ridge, looking down into Lully  
Valley - Christian Hollow.



28

Lully, Oneida Co., N.Y.,  
Friday, September 7, 1887.  
I visit an exposure of  
Lully Limestone, near  
the head of Emerson Gulch  
Creek, Otisco, on Lot 5  
near the house of John  
Kelrick.

An exposure of the  
upper hard rock, about  
20 to 25 feet above base.

1203 D.

$\frac{1}{2}$  mile south east of Harper,  
Lot 20, Lully, is 1204 A. This  
is the most extensive expos-  
ure of Lully Limestone I  
have anywhere found. The  
escarpment is long and,  
in some places, the rock  
is bared for rods. This has  
been washed by running  
water, though it is lower



25 feet above the  
valley - 75000 years ago,  
it was the valley bottom.  
This is the least length of  
time I can make for  
the removal of 50 feet  
from this valley.

It is, probably, much longer  
even; for the rock here in  
the valley bottom, like the  
rock in the lower parts of  
all valleys, is covered deep  
beneath alluvial gravel and  
drift; so that, for many  
millenniums, erosion has  
ceased. Not a particle of deep-  
ening has taken place in this  
valley, since the Glacial  
Epoch - 50000 years ago. All the  
valley deepening took place before



36  
Add 50,000 to 75,000, and the  
sum, 120,000 years, more  
nearly approximates the time  
that must have elapsed, since  
this rock was a river bed.  
As I stand on these hills, and  
look off into the valley of the  
Tioughnioga, about 2 1/2  
miles wide, and at least  
300 feet deep, and then take  
the insignificant stream  
now flowing along the valley  
bed, and note that it is only  
three or four miles to its head,  
and therefore must always have  
been comparatively small,  
my mind leaps back into  
the millions, since the water  
began to run along this chan-  
nel towards the Carbonifer-  
ous sea! Then these Portage  
Sandstones and Genesee Shales were  
swept away to form Carboniferous  
Sandstones and Shales.



31-

At the same time, on the west side a stream was running north, and cutting a deeper and much narrower channel for the Onondaga River.

That this stream has always run north only, since the great uplift, is manifest from the fall, now covered with drift, to the depth of 600 or more feet, looking north down that valley.

Water running north only could have cut Onondaga River Valley.

Since the Tioughnioga heads here in several small streams, running south, it must have always run south, since the uplift. Here, therefore, has always been the water divide, since it was first made dryland.



32--  
Tully, Onondaga Co., N. Y.,  
Saturday, September 8, 1888.  
It rains all the forenoon.  
In the afternoon, I ride along  
the west side of this valley,  
and determine where the  
Tully Limestone dips beneath  
the surface of the Valley.  
It is in the town of Proctor,  
Cortland Co., about one  
mile from the county  
line.

Directly across the valley,  
on the east side, Tully  
Limestone is fully 75 feet  
higher than the surface of  
Big Lake. This shows a  
southwestern dip, strong.

Mr. Cummings' Spring  
comes out on the top of Sec-  
tion N<sup>o</sup> 2, at Gardiners Glen.  
The top of the rock is more  
Twenty feet above, 62 feet above  
the level - which is 20 feet above the



33  
Jully, Oneida Co., N.Y.,  
Monday, September 10, 1888.  
I visit Otisco Valley, today.  
At J. C. Hamble's mill,  
Hamilton Shales dip  $\frac{1}{2}^{\circ}$  S.  
After leaving Tupper, I no  
where saw Lilly Limestone,  
until I crossed it, a short  
distance south of Oneida County  
south line, in Cortland Co.,  
where it is about 30 feet above  
Big Lake. On the west side  
of ridge where the road enters  
the gorge, to pass east, the Lilly  
Limestone is below the road,  
and the gorge is out entirely  
Genesee Shales and Portage  
Shales. This corresponds  
with the fact, that it sinks  
below Lionhollow Valley on  
the west side, a short  
distance below Big Lake;  
while, on the east side, it



sinks to the valley-surface  
a little north of Homer.

It does not come to the  
surface along the road  
from Vesper to Amber,  
on account of the heavy  
drift. It is in all the  
lateral gorges from about  
a mile south of the head  
of Otisco Lake, until  
the first gorge north  
of the road that passes  
the ridge to Lionghniopa  
Valley, where it lies below  
the drift. In crossing here,  
from Otisco Valley to Lionghniopa  
Valley, I find it fairly exposed  
on the side of the ridge, west  
side of Lionghniopa Valley,  
fully thirty (30) feet above the Lake.



This shows a dip S. W.

35

Gully, Onondaga Co., N. Y.

Tuesday, September 11, 1888

Today, I gather specimens in the road east of John Cusby's, till noon. 1200 ft

In the afternoon, I trace the outcroppings south from Cusby's to Meinert's, where it is still fully forty feet above the Valley.

It is more or less exposed at every gorge.

At Meinert's is one of the best I have seen.

On the east side, this rock seems peculiarly hard.

At Meinert's the top of the exposure is 41 ft above the Valley Road.



Sections of the Falls in  
the woods east of Chasin Smith's

- 1- 6 1/2 feet fall from the foot of  
the falls proper to the creek  
at the Mill.
- 2- 15 1/2 feet from the base of the  
limestone to the foot of the falls.
- 3- 6 3/4 from base of the limestone to  
its top - Genesee Shale  
About 5 feet, at top, of  
Argillaceous limestone.

A thin stratum of Argillaceous  
limestone, Shale, at about 50 feet  
several of the strata have seen  
thin seams of Argillite between.

There

There are seven partial falls  
through the limestone from 3 inches  
to six feet.

The above results were ob-  
tained by leveling from my eye  
when standing erect, 5' 10" and  
as the channel is very tortuous  
may, possibly, vary a little  
from the exactness of a  
level with a graduated  
rod, and rock mean: but  
it is very nearly correct.



Tully, Oneida Co., N.Y.,  
Wednesday, September 12, 1888

Today, I trace the outcropping  
of this Limestone on the east side  
of Thompson's Valley as far  
south as School House No 4,  
Poble, a mile south of Poble  
Station. The rock is there  
in place at the side of the  
road, fully 20 feet above the  
river. The rock exposure is  
about 10 feet below the upper  
face of the Tully Group.

This is Field Label 1205 A  
At C. C. Van Hoesen's, Field  
Label, 1205 B, there is a partial  
exposure; but these partial  
exposures are seen every  
little way along the lower  
part of the east hill.  
Just south C. C. Van  
Hoesen's house, the

3088  
29/9



37  
Tennessee Shale comes down  
flush to the road, no Tully  
Limestone appearing.

Then the Limestone rises,  
and, though unseen, runs  
along the base of the hill  
as far as I have seen.

All this appearance, on  
the east side and not  
on the west side of the  
Tionghmivoga Valley, shows  
a southwesterly dip.

At Wiergartner's, Field Label  
1205. (C), I made a fair collection,  
this afternoon.

The best for collecting is from the  
hill side, facing the valley  
highway.

C. C. Van Hoesen's farm is part of  
Lot 88, Preble, Cortland Co., N.Y.

Wiergartner's farm is part of  
Lot 88, Preble, Cortland Co., N.Y.



Tully, Onondaga Co., N. Y.  
 Friday, September 13, 1884

Packed specimens in a m.  
 Afternoon, I visited again  
 the falls, in the Chase woods.

I determine the following:

1. From Tionghinaga to the  
 foot of the falls. 6 ft
2. Fall in Hamilton Shale. 15
3. Tully Limestone 67
4. Calcareous Argillite 8

This Calcareous <sup>Argillite</sup> is entirely  
 different from the Genesee  
 Shale - Argillite.

It maintains its form and size  
 after the ripivation of the  
 Calcareous element and it  
 splits in slabs 1 to 2 inches  
 in thickness - very firm.

Genesee Argillite splits into  
 flakes, very small and light.  
 The Calcareous Argillite has a  
 very dark blue color. The same



Argillite is <sup>39</sup>black - no blue  
shade at all - sometimes a  
little rusty.

I have not the least hesitancy  
in retaining the former  
among the Tully Group.

The truth is, the Calcareous  
matter began to fail, towards  
the last of the Tully Epoch,  
while the Argillaceous  
element continued in  
full force.

In several thin seams,  
it was in excess, during  
the solidification, or  
rather precipitation of  
the Calcareous element.

The introduction of the  
Calcareous ~~epoch~~ epoch above  
the Hamilton was comparatively  
sudden. Not more than six  
inches of Argillaceous Limestone



was made at the bottom of  
the rock-top of Hamilton  
Shale; and, as appears from  
my specimens, Hamilton  
Fossils continued flush  
up to the introduction  
of the Calcareous Matter.

This is as it should be.  
When the water became  
so strongly impregnated  
with this matter, the former  
fauna would not find  
it healthy—must die.  
The source of this Lime  
is a mystery.



41-

De Lully, Onondaga Co., N.Y., -  
Friday, a.m., Sept. 14, 1884. I visited  
Weingartner's for specimens.  
Got a good lot of specimens.

In the p.m., I visited a  
fall, east of Weingartner's,  
on the assurance of Horace King,  
Esq., that it was in the  
Lully Limestone. Before  
reaching it, I found the Onondaga  
Shale in form; and, on reaching  
the fall, I found just what  
I anticipated, a fall over  
Portage Sandstones!

Mr King has very thoroughly  
read Dana; but reading and  
not informing a man how to dis-  
tinguish a rock by its appearance.  
Observation through the eye alone  
can do this.

Bunnings' farms are in lot C  
59, Preble, Cortland Co., N.Y.



42-

List of outcrops of Tully  
Limestone, in Tully Township.  
Beginning at Vespera thence  
all along the west side of the  
Valley to Cortland County -  
just east of Tully Centre, in  
Lot 39.

At Gardiner's, in Lot 39.

On the ridge north, in Lots 98  
10. On Lots 19 & 20 with 71 & 2.  
29 & 30 & 50

On the west side, the Lots are  
26, 27, & ~~28 & 47~~

In Otisco, the Lots are  
55, on Bear Head & Kingsley's Ridge  
56, 57 & 58.

And along Otisco Valley  
in all the ravines south of the  
Reservoir to the gulf road  
across into Preble, Livingston  
Valley.

In La Fayette, in Lots  
58, 59, 91, 92.

In Preble, in Lots 59, 69, 88,

+ 97 on the east side: on the west  
57 & 67.



43.  
Tully, Oneida Co., N. Y.  
Saturday, September 15, 1894.

Today, I have examined the  
hill east from Oneida.

Thence north to Summit Station.  
From Oneida's northwestern, the  
Valley rises as fast as the Tully  
Limestone; so that if the Limer-  
stone does not appear in  
the ridge west of the valley,  
it exists all along.

In the ridge north of  
Apulia, it does not exist.  
Taking a level from Mr  
James Miller M. Miles to 201,  
I find the level to indicate  
its existence; but it does  
not. This coincides with  
the theory of a south west dip  
at this meridian.



44

Monday, September 17, 1888

I gather Specimens, until  
the rain drives me in,  
at 1204 A, Lot 26, Tully.

Tully, Onondaga Co., N. Y.

Tuesday, September 18, 1888

Rain during all the a.m., and until  
1 1/2 p.m.

At 2 p.m., I go down to the  
partners to gather fossils. 1205h  
I also determine the elevation  
of this rock above the Tivough-  
niaga Valley, at the County  
Line, on the west side. It  
is fully forty feet above  
the Valley road, and more  
than 50 feet above surface of  
the lake, just east of the  
road. Below this outcrop,  
it is so masked by Drift that  
its position indeterminate; but



taking the exceedingly gradual depression of the rock for the last  $2\frac{1}{2}$  miles north, on this side, as the proper term of comparison, I do not think it can reach the level of the Valley, in the next four miles south, or down the Valley -

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On page 50, I have given a careful examination and measurement of the Lully Group at this place, which see



46-

Lilly, Onondaga Co., N. Y.,  
Manssary, September 19, 1888.  
Gather fossils, today, from the  
ledge west of Lionghingia,  
1204 A, Lot 25, Lilly.  
I take the height of that ledge above  
the road bed - about 96 feet.  
I find, at the top of Section A,  
a calciferous sandy shale, 15 inches  
thick. Some parts of this are  
very full of fossils.  
The top of this ledge is about  
50 feet above Onondaga Creek,  
below the moraine; and a  
level east & on the east, across  
Lionghingia Valley, shows  
exactly the same height as  
the exposure at Cusby's.



Jully, Onondaga Co., N. Y., —  
Thursday, September 20, 1888.  
I inspect the outcroppings  
of Jully Limestone along the  
east face of Meeker Hill;  
and find outcrop in Lots  
20, and 10, Jully, and Lot 10,  
Safayette, Onondaga Co., N. Y.

Collected Fossils from  
1206A, Lot 30, Jully, and  
from 1206B, Lot 10, Lafayette.

There are several outcrops  
along this face of the Hill,  
and the Limestone terminates  
on the north face of  
the ridge, Lot 10, Lafayette.  
There is much drift here, and  
a good deal of foreign  
Limestone: but Jully Limestone  
can easily be distinguished  
from all others.



48-

A level, ~~and~~ east, passes high  
over the next ridge — the one  
north of Apulia, but it strikes  
the top of the ridge east of  
Fabians. I shall, therefore,  
look for its outcropping there.

---

N.B. I found this outcrop,  
Thursday, Sept. 27, inst.

See page 54-



47

Lully, Onoaga Bay, N.Y. -  
Friday, September 21, 1888

I examine the Lully  
Valley on both sides, today,  
to determine where the  
Lully Limestone dips  
beneath the surface of  
the valley.

On the west side, it comes  
down to the valley, at about  
the line between the  
67 & 77 lots.

On the east side, it  
comes to ~~the~~ the valley about  
half a mile below

"Salman's Sawmill -  
in lot ~~78~~ <sup>79</sup>, over two miles  
farther south than it  
does on the west side.  
This shows, conclusively,  
that the dip is eastward.



50.

I find, on careful examination of the exposure near the County line, between Lot 47, Tully, and Lot 57, Preble, the most complete exhibition of the rock, I have yet anywhere seen: and, by careful leveling, I find 59 feet of rock, from its base, ~~at the side of the little creek,~~ at the spring below the bridge, to the top of the Cretaceous Argillite, in the second lot upstream.

I made it 63 feet, at the fall east of the old Chase Saw Mill, Lot 29, Tully,  $3\frac{1}{2}$  miles north east.

My measurements exceed any others, heretofore published, but I know they are correct.



51-

Nowhere else have I found  
so perfect an exposure of  
the junction between the  
"Lully, Pacificus Argillite  
and the Genesee Shale,  
as is here presented.

The junction between the  
"Lully Limestone base and  
the "Hamilton Shales is  
well presented at the fall  
above named, and in  
two places along the Barrett's  
Lodge exposure.

Now I have the Comacine  
all complete - no missing  
links in the chain.



5 L -

Tully, Oneida Co., N.Y.  
Saturday, September 22, 1888.  
Today, I visit Lumber Falls,  
in the township of Ironston,  
Cortland Co., N.Y.  $\frac{1}{2}$  mile  
south of the north line of  
the township and the county,  
and  $5\frac{1}{2}$  miles from this  
place, east by south.

This noted fall is in a  
small stream, just east  
of the outlet of Labrador  
Lake or Pond.

From the bridge in the  
road across this stream  
to a rust-colored stratum  
near the base of the stone,  
the altitude is 145 feet,  
the entire thickness of  
the Tully Group lying  
above.

I discovered also another  
exposure west of the pond.



Tully. 52  
 Monday, September 24, 1888.  
 Today, I revisit Limekiln Falls,  
 for further examination  
 and the collection of fossils.  
 I find the thickness of the  
 Tully Group to be as follows:  
 1. A doubtful Shale at base. <sup>feet.</sup> 5  
 2. Limestones proper. 56  
 3. Blue Calcareous Argillite.  $\frac{5}{66}$   
 Total

This is station 1207 A, Lat  
 $53^{\circ} 42'$ , Longitude, Portland Co.

Fossils are very abundant.  
*Atrypa* *Carbonifera* more  
 so than in any other place  
 I have yet visited.

This Limestone, moreover,  
 contains beds of intercalated  
 Shales - Calcareous Argillite.

These are generally fossiliferous.



1207A+

In the doubtful Shale  
just below the Limestone

1207A+

A few feet above the table  
over which the water falls,  
in a shaly stratum under  
a hard shelf.

59-

Lilly, Grandage Co. N. V., —  
Wednesday, September 26, 1888.  
I again set determine the  
locus of the Lilly Limestone,  
in the hill west of Labrador  
Pond.

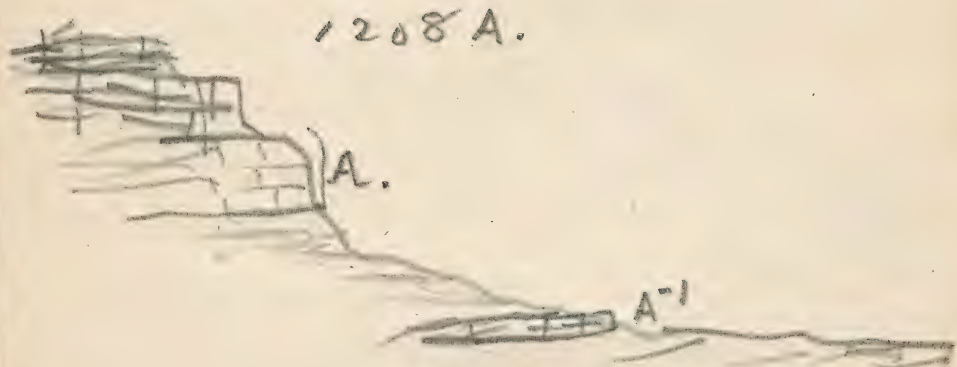
At the north end of the range,  
it rises but little above the  
drift hills, heaped against it,  
but, so soon as the Drift is  
left at the north in proceeding  
southward, it outcrops, about  
200 feet above the Pond, and  
it sets but little lower  
for the two miles along which  
I took note of its line.

At the first small run, I  
made a collection, at station  
1207B, lot 42, Fabius.

I made a still further col-  
lection from Little's Falls,  
1207A, lot 53, Inverton.



1208 A.



54

Tully, Oneida Co., N. Y.,  
Thursday, September 27, 1885.

I visit an outcrop of Tully  
limestone, lot 54, Tuxton,  
Cortland Co., N. Y., Station  
1208 A, 12 miles east of Link's  
Falls on lot 53, Tuxton.

At 1208 A the limestone is  
exposed in the bed of a small  
creek, for a long distance.

I had some very fine speci-  
mens, the best I have yet  
obtained.

I drove from 59, Tuxton,  
through 44, Fabius. In this  
lot, the road passes over the  
limestone at a spring water-  
ing-trough, and on the east  
side of the road is a fall.  
There is also a fall, 40 rods  
southeast of the house and  
spring, in a gorge.

The limestone comes to the  
north end of the ridges, south  
of Fabius, about 60 feet above the  
creek.



Monday, Sept 22

Willy, ~~Portland~~ Co. N. Y.

Saturday, September 23, 1888

I collect specimens again  
at Liker's Falls, Lot 53,  
Troyton, Portland Co., N. Y., -  
Station 1207 A. I find  
some hitherto unrec-  
ognized specimens e.g. *Lituites*.  
This load fills my sixth  
box.



1210

55

De Ruyter, Madison (Tn), A.M.  
Friday, October 5, 1888.

This forenoon, I have found  
the Tully Group, on Lots  
52 and ~~51~~<sup>58</sup>, Township of  
Tromp, De Ruyter, on both  
sides of the Valley of East  
Branch, Tionghogah River.  
On the north side is the  
southern edge of a table,  
the northern edge of  
which comes to the surface  
some miles north of this.  
That on the south side,  
is the northern edge of  
a table that, dipping under  
the southern hills, disap-  
pears to reappear no more,  
unless among some of the  
Pennsylvanian Folds - a  
possibility which seems



57-

nowhere realized, or at least, not recognized.

This same fact is reported to me as existing at Truiston? if so, then we have here the southern limit well defined, by this valley. I shall determine this point, right away.

This afternoon I have located this rock, on the base of the hills, northwest of the Depot. It forms here as in many other places, a table along the face of the hills.

Along this table, I have, this afternoon, gathered my first bagful of specimens - Station 1209A. The extreme thickness of the exposures on lots 524<sup>56</sup> is about 40 feet. The base and



58-

top are not well defined, in  
either case.

The limestone seems  
more impure than I  
have hitherto found it.  
Station <sup>1210</sup>~~1209~~ is on Lot 38.



59  
DeRuyter, Madison Co., N.Y.  
Monday, October 8, 1888.

This forenoon, I have  
identified the Lilly Group  
in a gorge on Lot 24, 35  
DeRuyter, Madison Co.  
It forms the top of a series  
of Cascades, the bottom  
being, as usual, in the  
Hamilton Shales.

From my observations on  
this hill, I am convinced  
that the Lilly also cuts  
the next hill north-  
Station ~~1211~~ 1211



Be Buxton, Harrison Co., K<sup>Mo</sup>.  
Wednesday, October 10, 1893.  
I go to Buxton, this a.m.

I find Tully Group on Lot  
59 & 82, Buxton. 1211.1212

This is very shaly, more  
so than I have before any  
where seen.

It is a good place for  
collecting Fossils.

Its line of outcrops is  
all along on the north  
side of the valley; on the  
south side, the line  
is well enough marked;  
but it is entirely masked  
by the vast amount of  
drift. None of the small



Spring rivulets now below  
the drift.

$\frac{3}{4}$  of a mile N. N. W. of the  
village of Troylet is  
<sup>3 1/2 mps</sup> Cottage Glen. Here is a  
fall over the Tully Ls.  
Group, very similar to  
Linker's Falls. It is a  
somewhat larger stream  
than that of Linker's Falls.  
This is a good place  
for collecting.

Station 1212. Lot 86.

I obtained a fine slab from  
the lowest shale, showing  
Hamilton Fossils.



De Ruyter, Madison Co., N.Y.,  
Thursday, October 11, 1888.

I revisit Spicer's Glen,  
and make fine collection.  
I take the height of the  
fall from the corner  
of the main road—  
equal to  $100\frac{1}{2} + 8'$ ;

to the bottom of limestone  
just fifty feet, leaving  
just fifty  $50\frac{1}{2} + 8'$  of  
the limestone without  
the doubtful shale at  
the bottom or any of  
the Califerous Argillite  
above, which is not ex-  
hibited.

I have a growing wonder  
that other geologists  
have found so little  
thickness in this Group.  
I know I am correct.



De Ruyter, Madison Co., N.Y.  
Saturday, October 13, 1888.  
Today, though the weather threatened,  
I have visited along the line of  
outcrops on the west side of the  
valley north of De Ruyter.

I found a good exposure in  
a gorge on the east face of the  
hill, Lot 50, Cayler, Cortland  
Co. The wall here rises vertically  
for many feet. Station 1213 ft.  
I here found an *Atrypa* *Arche*  
*oides*, in the face of the wall,  
about midway. The exposure  
here is only partial.  
Next is a gorge on Lot 50,  
~~Cayler~~ Tabers, Onondaga  
Co. I did <sup>not</sup> go to this, but it is  
there.

The next is on Lot 40, Tabers,  
Onondaga Co., N.Y.  
This I visited. It is decidedly  
the best exposure I have  
anywhere seen. I had not



time to take the thickness;  
but I estimate it, at least,  
70 feet. Station 1214.

The Calcareous Argillite  
is not here exposed; but I  
found loose pieces of it in  
the stream above the falls.  
This limestone, the upper  
10 feet, was quarried for  
building the Reservoir Dam.  
Above Pickett's house,  
at the south, on Lot 20,  
Fabius, is another good  
exposure. This is a gorge on  
the north end of the long  
ridge which faces the valley  
north of De Ruyter, from  
Lot 59, Angler, to Lot 20, Fabius,  
a distance of six miles.

The road up the hill, at the  
west of Pickett's house crosses  
the line of outcrops about  
one mile south west of



Pickett's house. The exposures are slight here. We immediately find ourselves ascending the hill on the fine Tennessee Shales.

From the Pickett Hill exposure on Lot 20, Fabians, to Lot 42, Fabians, called Sabradore Hill, south of Summit Station, on the Binghampton and Syracuse N.Y. R.R., there is a series of hills, all terminating at the north, looking down into a transverse valley, between them & the Pompey Hills. Every one of these hills, between 42 & 20, has a line of outcrops across its north end. On some of them, the limestone forms tables. Then, between every two of these ridges, are two lines of outcrop running south.



Thence, at Labrador Bend, the line runs on both the west and the east sides.

In the valley running north from Beatty's the two lines are as they should be; but the east line turns northeast along the upper part of the & north branch of "Tonawanda"; but the hill that runs parallel with Beatty's Reservoir, is too low. It is wholly in Hamilton shales.

So much I have today determined. The Stratigraphy is very simple; and it seems to me, a little strange that Geologists have failed to discover what is so exceedingly plain.





Falls.

Chase's Sawmill

Small lateral branch

Upper Falls.

Tully Limestone

Course of Tioughnioga North from Tully.





## Section Tully Limestone

Calcareous Argillite.  
Argillaceous Limestone.

Solid Limestone with  
thin seams of Argillite.

= Thin seam of Argillaceous  
Limestone

There are several fossiliferous Strata of these Limestones, but, to make them available, they need a long exposure to the influences of varying temperature and moisture. Some of the Argillites easily yield fossils.

Hence, from this Limestone in situ it is almost impossible to obtain a single fossil. From loose fragments, any amount may be obtained. In order to determine the horizon of a fossil, it is necessary to study closely the Lithology of the rocks in situ, and then compare the loose fragments.







68-

yet ~~found~~ measured. I think the exposure on Lot 30, Fabins, west of the Reservoir Dam, is heavier than this. These two are a little over 7 miles apart, and Linker's Falls is 7 miles northwest of Spicer's Glen. At the stream, near the southeast corner of Lot 85, Cuyler, I discovered a table of this Limestone, which exhibits, most beautifully, the Life of its day. It is too large to manage, but it is a splendidly instructive lesson, in the Hieroglyphs of the ancient seas. I could study it a month, without exhaustion — Trilobites of numerous species, Shells, and tracks. This is well up in the Group.



69-  
At Cuylerville, I find  
the Group outcropping, on  
the south side of Tioga-  
nioga Valley, south and  
southwest of the village,  
nearly or quite 100 feet  
above the river-bed.

This gives me the 'miss-  
ing link', on the south  
side of the valley, from  
Burdick's Glen, above DeCuyter,  
southeast, to Cuylerville.

I have not, before, been able to  
find the line, though I knew  
it must be there. The drift  
is very heavy, and no stream,  
from Burdick's to that at Cuylerville,  
is heavy enough to cut down to  
the bed-rock.



In the stream, at Cuylerville,  
I found the Hamilton Shale,  
upper part, and I instantly knew  
that the Tully Group must be  
exposed. I took the first  
lateral branch from the west,  
and, in a few rods, I found it,  
southwest of the depot,  
about 80 rods - bottom of  
the group. 1216 Station.  
I then took a level from  
that position, southeast, up  
the main run, and I found  
that it reaches the stream,  
half a mile away in that  
direction.  
Here it disappears beneath  
the Southern hills.  
Here I close this book  
and open Book B.



